

FACT SHEET FOR NPDES PERMIT WA0020320
CITY OF KALAMA

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INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES) of permits, which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the state of Washington to administer the NPDES permit program. Chapter 90.48 Revised Code of Washington (RCW) defines the Department of Ecology's (Department) authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the state include procedures for issuing permits [Chapter 173-220 Washington Administrative Code (WAC)], technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least 30 days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

<u>GENERAL INFORMATION</u>	
Applicant	City of Kalama
Facility Name and Address	Kalama Wastewater Treatment Plant 206 Hendrickson Drive Kalama, WA 98625
Type of Treatment	Old Facility: Activated sludge with chlorine disinfection New Facility: Larger Activated sludge with UV disinfection
Discharge Location	Columbia River Latitude: 46° 00' 19" N Longitude: 122° 50' 50" W.
Facility Location	Latitude: 46° 00' 21" N Longitude: 122° 50' 43" W.
Water Body ID No.	Old No. WA-28-1010, New No. 1220169456238

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY

The Kalama City sewer system dates back to 1955 when most of the city sewers were installed. In 1975 the original "spirogestor" plant was upgraded to an activated sludge plant. Planning for replacing the old plant began as early as 1992 with a General Sewer Plan and Engineering Report. The City completed a comprehensive Plan in 1994, a Capital Facilities Plan in 1995-2000, and a new General Sewer/Wastewater Facilities Plan in 2002. The recommendation of the final plan was to replace and upgrade most of the plant with a new activated sludge plant with new headworks, new aeration basins, new clarifiers, a new pump station, replacement of the chlorine disinfection system with Ultra Violet (UV) disinfection, and conversion of some of the old aeration basins into anaerobic digesters for sludge handling. See Appendix C for a schematic of the new plant.

COLLECTION SYSTEM STATUS

The collection system has old sections of pipe dating to 1955 made of asbestos-cement and concrete. In 1997 approximately 18,000 feet were replaced with PVC and HDPE pipe in a program to reduce I/I. As of 1991, there were approximately 50,000 feet of main line gravity sewers and 30,000 feet of side sewers. About 6,000 feet of main line sewers have been added since then.

There are three lift stations and associated force mains in the collection system. The lift stations include the Meeker Drive station with 320 gpm capacity, the Kingwood Street station with 50 gpm capacity, and the Old 99 station with 100 gpm capacity. These lift stations and the force mains were constructed from the 1960s through the 1990s. There are 25 septic tanks with effluent pumped (STEPS) to the system.

TREATMENT PROCESSES

The old system: The old (existing in 2003) facility is scheduled to be replaced within the next 24 months. The old facility consists of an influent pump station with manually cleaned bar screens; two aeration basins that use the activated sludge process; two secondary clarifiers; two chlorine contact chambers; an aerobic digester for sludge handling and a single port submerged outfall in the Columbia River. Flow is measured at the effluent end of the plant after the chlorine contact chamber with a propeller type of meter. Until the new system is built and operating an existing Agreed Order DE02WQSR-3586 must be adhered to and will be referred to in the permit. More will be discussed about this order below.

The new system: The new facility will consist of a new influent pump station with three new variable speed submersible pumps located in a 19-foot deep wet well. A fourth pump may be added for later expansion. Two pumps will be able to meet the current peak loading allowing one pump to be out for service. The new headworks will have influent flow monitoring with a Parshall flume. The influent will pass through a 1/4-inch mechanical fine screen or a bypass bar screen and then to an aerated grit removal system.

The new aeration basins will have a new flow-splitter box to send flow to two aeration basins running in parallel. Within the aeration basins there will be a series of panels that create three selector zones that will aid in selecting non-filamentous microorganisms with improved settling characteristics. More baffles within the aeration basin will provide a serpentine path to lengthen travel time through the basin. The

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aeration will be provided by fine-bubble diffusers and anoxic selectors will use coarse-bubble diffusers for oxidation and mixing. The air will be supplied by two new blowers with a third blower on standby.

The flow leaving the aeration basins will enter a clarifier flow-splitting box and then enter two new circular center-feed clarifiers.

The flow from the clarifiers will be disinfected by a new UV system. The UV system will consist of two banks of 12 lamps, each in a low-pressure, high output, horizontal setup. The system should be able to disinfect the maximum monthly flow with one of the banks operating and the second bank on standby and should disinfect the peak-day flow with both banks on.

The old and new plant are both classified as Class II. The operator in charge of the treatment plant must have a Group II certification and operators in charge of each shift must have at least a Group I certification. At the time of the August site visit, the lead operator had a Group II certification and the City Public Works Director had an Operator In Training certificate. There were also three other individuals with Group I certification. The facility is staffed from 7:00 AM to 3:00 PM Monday through Friday and for two hours on weekends. Operators are also on-call during the off hours.

There is one industrial facility, RSG Lumber Company, which discharges approximately 5,000 gal/day of saw cooling water to the system. There are a couple of facilities housed at the Port where the plant is located that discharge toilets to the facility. There are six to eight restaurants that discharge to the system, however, each restaurant has a grease trap that is pumped yearly. There are currently 25 Septic Tank Effluent Pumped (STEP) systems that discharge to facility which are also supposed to be pumped yearly.

In order to finance the new facility, the City has undertaken a rate increase of 10.5 percent for the years 2002 through 2006. This rate increase makes the City eligible for meeting hardship status under grant and loan rules. The City will therefore be receiving a State Revolving Fund (SRF) loan for \$5,275,130 and a Centennial Hardship Grant for \$1,704,870. The local contribution is \$510,000. The total cost of the project as of May 2003 was \$7,490,000 which also includes a sewer collection line.

Because the existing Kalama facility has had difficulty meeting water quality limits, the Department of Ecology and the City of Kalama entered into an Agreed Order (DE02WQSR-3586) which prohibits the connection of new sewer service until the plant has been upgraded and capacity increased. The order also prohibits increases in hydraulic and organic loading from industrial, commercial, or residential sources. The Agreed Order will stand and the City shall not accept septage or septic tank effluent pumped (STEP) tank solids for treatment at the wastewater treatment facility. This order will remain in effect until the upgrades are complete.

Some of the stipulated facts under the order are as follows:

- The City has concluded that the present facility cannot be modified to reliably meet the required discharge standards and the reduction in flows through continued I&I reduction efforts alone will not restore compliance.
- To regain compliance with all National Pollutant Discharge Elimination System (NPDES) permit requirements, the City will construct a new wastewater treatment facility as soon as reasonably possible.

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- In the interim, the City will take the actions identified in Sections III and IV of this Agreed Order to limit any increase in hydraulic or organic loadings to the treatment plant from commercial, industrial, and residential sources.

DISCHARGE OUTFALL

Secondary treated and disinfected effluent is discharged from the facility via a 15-inch single port outfall into the Columbia River. The outfall extends approximately 117 feet into the River at a depth of 25-feet at Mean Lower Low Water (MLLW). The outfall is perpendicular to the shore and current flow and dips down into the river at an angle of approximately 20°. This leaves the outfall 9-feet off of the bottom and supported by piles. The end of the outfall is protected by a large piling dolphin. In the upgrade, the facility must install extra ports in the outfall to act as a diffuser. The diffuser will have 7 ports each of which will be 2-inches in diameter spaced 3-feet apart. The upgrade will not be deemed complete until the diffuser ports have been installed.

RESIDUAL SOLIDS

The facility removes solids during the treatment of the wastewater at the headworks (grit and screenings), and at the clarifiers, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Grit, rags, scum and screenings are drained and disposed of as solid waste at the local transfer station which is regulated by the Cowlitz County Health Department. Solids removed from the clarifiers are treated in the aerobic digesters and hauled-off to be land applied at a permitted beneficial use facility. This facility was noted as "Fire Mountain Farms" in November 2003.

PERMIT STATUS

The previous permit for this facility was issued on January 13, 1999. The previous permit placed effluent limitations on five-day Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), pH, Fecal Coliform bacteria, and total residual chlorine.

An application for permit renewal was received by the Department on July 15, 2003, and accepted by the Department on November 17, 2003.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility received its last inspection on August 20, 2003.

During the history of the previous permit, the Permittee has had great difficulty remaining in compliance. Based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department from 1999-2003, there were 76 violations. These violations are summarized as follows:

Violation Summary for Old Plant 1999-2003

Parameter	Number of violations
BOD ₅ lbs/day (Weekly and monthly limits)	9
BOD ₅ mg/L (Weekly and monthly limits)	12
BOD ₅ % removal	10
TSS lbs/day (Weekly and monthly limits)	11

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TSS mg/L (Weekly and monthly limits)	17
TSS % removal	13
pH standard units (min.)	4
Flow (months operating above 85% of capacity)	6
Flow (months operating above design capacity)	3

The table above shows that the old system has been overloaded. Especially revealing is the number of months the facility has operated outside of its original design capacity. The new system should have no trouble meeting these same parameters.

WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the NPDES application and in discharge monitoring reports. The effluent is characterized as follows:

Table 1: Wastewater Characterization

<u>Parameter</u>	<u>Concentration</u>
pH	6.2 to 7.34 (5 th and 95 th percentiles for 2002 and 2003 summer data)
Temperature	21.25° C (95 th percentile of Summer influent data from 1998)
Hardness	37 mg/L (5 th percentile)
Alkalinity	35 mg/L (5 th percentile)
Copper	0.057 µg/L (highest of four values)
Lead	0.0008 µg/L (most values below detection)
Magnesium	2.8 mg/L
Ammonia-N	1.1 mg/L

The following parameters were below detection levels when tested and therefore a value of 0 was used for any analysis: antimony, arsenic, beryllium, cadmium, chromium, mercury, nickel, selenium, silver, thallium, and zinc.

Because BOD and TSS will change dramatically with the new facility, the old values are not shown here and will need to be reevaluated during the next permit cycle after the new facility data is available.

Because there are no industries discharging to this facility the toxic metals are assumed to be very low.

SEPA COMPLIANCE

The construction for the new facility had not begun as of the writing of this fact sheet. State Environmental Policy Act (SEPA) compliance was documented in the Facility Plan.

PROPOSED PERMIT LIMITATIONS

Federal and state regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the

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National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the state of Washington were determined and included in this permit. The Department does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

DESIGN CRITERIA

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are taken from the July 2002 engineering report prepared by Gray and Osborne (G&O, 2002) and are as follows:

Table 2: Design Standards for the old and new Kalama WWTP.

Parameter	Existing Design Quantity	New Design Quantity
Monthly average flow (max. month)	0.4 MGD	0.8 MGD
Peak day flow		1.72 MGD
BOD ₅ influent loading (max. month)	667 lbs/day	1046 lbs/day
TSS influent loading (max. month)	667 lbs/day	992 lbs/day
Connections	784 ERUs	1,840 ERUs

The existing population shown on the application in 2003 is 1,960 people. A conversation with the city public works director in December 2003 revealed that: of those served, approximately 1,820 people were inside city limits and 140 were outside of city limits. The new facility was designed on the basis of 1,804 Estimated Residential Units (ERUs) with 2.5 people per ERU. This works out to 4,510 people for the design population of most of the parameters shown above in table 2. The facility plan (G&O, 2002) based these population and loading calculations on the facility reaching this capacity by 2021. The new sewer and lift station improvements were designed for the year 2021 and lift station wet wells were designed to handle flow throughout build out, which would have 8,648 ERUs equivalent to 21,620 people.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

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The following technology-based limits for pH, fecal coliform, BOD₅, and TSS are taken from Chapter 173-221 WAC are:

Table 3: Technology-based Limits.

Parameter	Limit
pH:	shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 ml Weekly Geometric Mean = 400 organisms/100 ml
BOD ₅ (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
Chlorine	Average Monthly Limit = 0.5 mg/L Average Weekly Limit = 0.75 mg/L

The existing facility has a chlorine limit, however the new facility will use UV disinfection and therefore will not have a chlorine limit. The technology-based monthly average limitation for chlorine is derived from standard operating practices. The Water Pollution Control Federation's Chlorination of Wastewater (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/liter chlorine residual is maintained after fifteen minutes of contact time. See also Metcalf and Eddy, Wastewater Engineering, Treatment, Disposal and Reuse, Third Edition, 1991. A treatment plant that provides adequate chlorination contact time can meet the 0.5 mg/liter chlorine limit on a monthly average basis. According to WAC 173-221-030(11)(b), the corresponding weekly average is 0.75 mg/liter.

The old permit had a narrative chlorine limit that required the chlorine to be minimized. The proposed permit includes an interim numeric limit for the old facility and no limit for the new facility. The new facility will have UV disinfection eliminating the need for chlorine.

The following technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

BOD monthly effluent mass loadings (lbs/day) were calculated as the maximum monthly influent design loading (1,046 lbs/day) x 0.15 = 157 lbs./day.

The BOD weekly average effluent mass loading is calculated as 1.5 x monthly loading = 235 lbs/day.

TSS monthly effluent mass loadings (lbs/day) were calculated as the maximum monthly influent design loading (992 lbs/day) x 0.15 = 149 lbs/day.

The TSS weekly average effluent mass loading is calculated as 1.5 x monthly loading = 223 lbs/day.

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SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL). No TMDL has been conducted for these waters at this time.

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the state of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the state of Washington.

ANTIDEGRADATION

The state of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when receiving waters are of higher quality than the criteria assigned, the existing water quality shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

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MIXING ZONES

The Water Quality Standards allow the Department to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to the Columbia River which is designated as a Class A receiving water in the vicinity of the outfall. There are no other outfalls within a mile of the City of Kalama outfall. Significant nearby non-point sources of pollutants include the marina at the Port of Kalama and various storm water runoff entry points. There is the Interstate-5 highway and a major railroad corridor upland of the treatment plant that run through the City of Kalama.

Characteristic uses of Class A water includes the following: water supply (domestic, industrial, agricultural); stock watering; fish migration; fish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Fecal Coliforms	100 organisms/100 ml maximum geometric mean
Dissolved Oxygen	8 mg/L minimum
Temperature	18 degrees Celsius maximum or incremental increases above background
pH	6.5 to 8.5 standard units
Turbidity	less than 5 NTUs above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

At present there has been no TMDL conducted for this portion of the Columbia River. The 303(d) listings for water resource inventory area (WRIA) 27 where Kalama discharges include the following parameters:

4,4'-DDE, arsenic, Bis(2-ethylhexyl)Phthalate, Dieldren, PCB-1254, temperature, and total dissolved gas.

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Most of the chemicals listed are unlikely to come from Kalama's municipal discharge. The 303(d) listing also includes locations where the parameters were monitored and they did not occur within a mile of the Kalama discharge. The temperature and arsenic are parameters of concern that can occur in municipal discharges and will be discussed below. The total dissolved gas is predominantly an artifact of water spilled at the Columbia River dams and is very unlikely to be discharged by the City of Kalama.

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and are defined as follows:

The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition by the use of the visual plumes dilution model (G&O, 2002 Appendix C). The dilution factors have been determined to be:

	Acute	Chronic
Aquatic Life	23	79

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

The critical condition for the Columbia River is the seven day average low river flow with a recurrence interval of ten years (7Q10). Ambient data at critical conditions in the vicinity of the Kalama outfall was taken from the Department Environmental Assessment Ambient River Data Base. The data used and shown below was taken from station 28A100 which is close to Vancouver, Washington. This station, however, was the closest ambient monitoring station on the Columbia River to the Kalama discharge. The data from this station was only available for 2003. Therefore, the ambient background data used for this permit includes the following:

Parameter	Value used
7Q10 low flow	80,725 cfs
Velocity	34.17 cm/s (1.12 ft/sec) 50 th percentile 8 cm/s 10 th percentile 50cm/s 90 th percentile
Depth	30 feet avg.
Width	2,400 feet
Slope	0.00003

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Temperature	21.23° C (90 th percentile)
pH	7.055 (10 th percentile), 8.0 (90 th percentile)
Dissolved Oxygen	8.9 mg/L (10 th percentile)
Total Ammonia-N	0.0189 mg/L (90 th percentile of 12 samples)
Fecal Coliform	23.8/100 ml (90 th percentile)
Hardness	48.75 mg/L as CaCO ₃ (10 th percentile)
Arsenic	1.15 µg/L (highest value of six samples)
Chromium	0.55 µg/L (highest value of six samples)
Lead	0.38 µg/L (highest value of six samples)
Copper	1.5 µg/L (highest value of six samples)
Zinc	5.6 µg/L (highest value of six samples)
All Other Metals	0.0 (below detection limits)

The following parameters were evaluated to determine if they would be met by the new facility.

BOD₅--This discharge with technology-based limitations results in a small amount of BOD loading relative to the large amount of dilution occurring in the receiving water at critical conditions. Technology-based limitations will be protective of dissolved oxygen criteria in the receiving water. The facility plan (G&O, 2002) ran the Streeter-Phelps analysis of critical dissolved oxygen sag. This model run showed a critical concentration of 7.94. The model however should have used a lower ambient DO value of 8.9 mg/L. The Water Quality Standards WAC 173-201A allows for special condition for DO in this segment of the Columbia River which is 90 percent of saturation. The DO at saturation in the vicinity of Kalama with a 40 foot elevation would be approximately 8.40 mg/L. At 90 percent of saturation, this value would be 7.56 mg/L. The new Kalama facility should not have difficulty meeting the DO criterion but should be nitrifying the wastewater to remove ammonia and nitrogenous BOD. The new facility will be equipped with selectors to aid in nitrification.

Temperature and pH--The impact of pH and temperature were modeled using the calculations from EPA, 1988. The input variables were dilution factor 79, upstream temperature 21.23°C, upstream pH 7.06, upstream alkalinity 46(as mg CaCO₃/L), effluent temperature 22.5°C, effluent pH of 6, effluent pH of 9, and effluent alkalinity 35 (as mg CaCO₃/L). The effluent temperature is based on influent temperatures recorded from July through October 1998. The actual effluent temperatures may be slightly higher due to solar heating.

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology-based effluent limitations for pH was placed in the permit and temperature was not limited. With the large amount of dilution, the temperature difference at the mixing zone boundary is 0.02°C which is much less than the 0.3°C allowed. Because temperature is a concern in the Columbia River and has not been well evaluated at the Kalama facility, monitoring will be required in the new permit. The temperature will need to be re-evaluated in the next permit.

The new Water Quality Standards will be changing for temperature, but have not yet been approved by EPA. Because the new water quality criterion for temperature is more complex than the old criterion, there will be a footnote that details the sampling and analysis that needs to be conducted. Temperature should be evaluated continuously during June through October using micro-recording thermographs (also

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known as TIDBITS). The receiving water upstream of and near the outfall should be monitored as well as the effluent. The following footnote shall accompany the monitoring portion S2 in the permit:

Temperature shall be reported as: daily maximum, the seven-day running average of the daily maximum, and the monthly maximum of the seven-day running average of the daily maximum. When continuous recording is not available, temperature should be monitored during the mid-afternoon.

Fecal coliform--The numbers of fecal coliform were modeled by simple mixing analysis using the technology-based limit of 400 organisms per 100 ml and a dilution factor of 79. The background was 24 org/100 ml and the fecal coliform at the edge of the mixing zone would be 29 org/100 ml, therefore the water quality criterion of 100 would be met at the edge of the mixing zone. The technology-based effluent limitation for fecal coliform bacteria was placed in the proposed permit.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge: chlorine, ammonia, copper and lead. Twelve other metals and toxics were sampled and were found to be below detection and therefore were determined to be not present in the effluent. A reasonable potential analysis (See Appendix C) was conducted on these parameters to determine whether or not effluent limitations would be required in this permit.

The determination of the reasonable potential for chlorine, ammonia, copper and lead to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 (Appendix C) at the critical condition. These parameters were found to have no reasonable potential to violated water quality criteria. The critical condition in this case occurs during the summer months for ammonia and year round for the metals. The parameters used in the critical condition modeling are as follows: acute dilution factor 23, chronic dilution factor 79, receiving water temperature 21.23°C, receiving water hardness 48.75 mg/L and alkalinity was estimated to be at 46 mg/L. With the exception of copper, lead, and ammonia, the effluent values were below detection during four sampling events. A value of zero background was used for each parameter. Those metals values that were undetected were determined to not have a potential to violate water quality standards.

No valid ambient background data was available for antimony, beryllium, chlorine, selenium, or magnesium. A determination of reasonable potential using zero for background resulted in no reasonable potential to violate water quality standards. Water quality criteria for metals in Chapter 173-201A WAC are based on the dissolved fraction of the metal.

The Permittee may provide data clearly demonstrating the seasonal partitioning of the dissolved metal in the ambient water in relation to an effluent discharge. Metals criteria may be adjusted on a site-specific basis when data is available clearly demonstrating the seasonal partitioning in the ambient water in relation to an effluent discharge.

Metals criteria may also be adjusted using the water effects ratio approach established by USEPA, as generally guided by the procedures in USEPA Water Quality Standards Handbook, December 1983, as supplemented or replaced.

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Valid ambient background data was available for ammonia, arsenic, cadmium, chromium, copper, lead, nickel, silver, and zinc. Calculations using all applicable data resulted in a determination that there is no reasonable potential for this discharge to cause a violation of water quality standards. This determination assumes that the Permittee meets the other effluent limits of this permit.

WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

In accordance with WAC 173-205-040, the Permittee's effluent has been determined to have the potential to contain toxic chemicals. The proposed permit contains requirements for whole effluent toxicity testing as authorized by RCW 90.48.520 and 40 CFR 122.44 and in accordance with procedures in Chapter 173-205 WAC. The proposed permit requires the Permittee to conduct toxicity testing for one year in order to evaluate both the acute and chronic toxicity of the effluent.

If acute or chronic toxicity is measured during effluent evaluation at levels that, in accordance with WAC 173-205-050(2)(a), have a reasonable potential to cause receiving water toxicity, then the proposed permit will set a limit on the acute or chronic toxicity. The toxicity will be reevaluated at the next permit renewal and if needed the Department may require the Permittee to conduct further WET testing in order to monitor for compliance with either an acute toxicity limit, a chronic toxicity limit, or both an acute and a chronic toxicity limit. The proposed permit also specifies the procedures the Permittee must use to come back into compliance if the limits are exceeded.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, LC₅₀, EC₅₀, IC₂₅, etc. All accredited labs have been provided the most recent version of the Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* which is referenced in the permit. Any Permittee interested in receiving a copy of this publication may call the Department Publications Distribution Center 360-407-7472 for a copy. The Department recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

When the WET tests during effluent evaluation indicate that no reasonable potential exists to cause receiving water toxicity, the Permittee will not be given WET limits.

If the Permittee makes process or material changes which, in the Department's opinion, results in an increased potential for effluent toxicity, then the Department may require effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased

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if WET testing conducted fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard." The Permittee may demonstrate to the Department that changes have not increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made.

Because the facility is being rebuilt, a new WET test will be needed to determine if any toxicity is occurring. It does not appear that toxicity testing has been conducted in the past. It is recommended that toxicity testing be conducted twice during the first year of operation (once in the winter and once in the summer for evaluation of acute and chronic toxicity). If no toxicity shows up, then it is likely that no more testing will be needed.

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the applicant's discharge is unlikely to contain chemicals regulated for human health, and is undergoing technology-based upgrades and therefore does not contain chemicals of concern based on existing data. The discharge will be re-evaluated for impacts to human health at the next permit reissuance.

SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has determined through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the Sediment Management Standards.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED JANUARY 13, 1999

There will be an interim period when the old facility is still running but covered under the new permit. The final limits will apply to the new facility by the date outlined in the permit. The new facility is expected to be on-line in March of 2005.

Parameter	Existing Limits (Old Facility)	Proposed Interim Limits (Old Facility New Permit)
BOD ₅	30 mg/L, 100 lbs/day (monthly) and 85% min. removal	30 mg/L, 100 lbs/day (monthly) and 85% min. removal

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	45 mg/L, 150 lbs/day (weekly)	45 mg/L, 150 lbs/day (weekly)
TSS	30 mg/L, 100 lbs/day (monthly) and 85% min. removal 45 mg/L, 150 lbs/day (weekly)	30 mg/L, 100 lbs/day (monthly) and 85% min. removal 45 mg/L, 150 lbs/day (weekly)
Fecal Coliform	200 org/100 ml (monthly) 400 org/100 ml (weekly)	200 org/100 ml (monthly) 400 org/100 ml (weekly)
pH	Shall not be outside the range 6.0 to 9.0	Shall not be outside the range 6.0 to 9.0
Total Residual Chlorine	Minimized	Average Monthly Limit = 0.5 mg/L Average Weekly Limit = 0.75 mg/L

Parameter	Existing Limits (Old Facility)	Proposed Final Limits (New Facility, New Permit)
BOD ₅	30 mg/L, 100 lbs/day (monthly) and 85% min. removal 45 mg/L, 150 lbs/day (weekly)	30 mg/L, 157 lbs/day (monthly) and 85% min. removal 45 mg/L, 235 lbs/day (weekly)
TSS	30 mg/L, 100 lbs/day (monthly) and 85% min. removal 45 mg/L, 150 lbs/day (weekly)	30 mg/L, 149 lbs/day (monthly) and 85% min. removal 45 mg/L, 223 lbs/day (weekly)
Fecal Coliform	200 org/100 ml (monthly) 400 org/100 ml (weekly)	200 org/100 ml (monthly) 400 org/100 ml (weekly)
pH	Shall not be outside the range 6.0 to 9.0	Shall not be outside the range 6.0 to 9.0
Total Residual Chlorine	Minimized	No limit because UV disinfection will be used.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

Monitoring for temperature and WET testing is being required to further evaluate the effluent. These pollutants could have a significant impact on the quality of the surface water.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Sludge monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past

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compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of Ecology's *Permit Writer's Manual* (July 1994) for an activated sludge plant operating at less than 2.0 MGD average design flow.

Additional monitoring is required in order to further characterize the effluent. These monitored pollutants could have a significant impact on the quality of the surface water.

LAB ACCREDITATION

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. The laboratory at this facility is accredited for: general chemistry and microbiology which includes BOD, CBOD, Cl, DO, pH, TSS, and Fecal coliform.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4 to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4 , therefore restricts the amount of flow and must be complied with.

OPERATION AND MAINTENANCE (O&M)

The proposed permit contains Condition S.5 as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment. Because the facility is being rebuilt in addition to new parts of the collection system, the proposed permit requires submission of an updated O&M manual for the entire sewage system. The new O&M manual must be submitted before the new facility comes on-line. Therefore, the manual is generally required before the new facility is 90 percent complete.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems the Permittee is required in permit Condition S7 to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and State Water Quality Standards, WAC 173-201A, and Biosolids Handling regulations covered under WAC 174-308.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503, and by the Department under Chapter 70.95J RCW and Chapter 173-308 WAC. The disposal of other solid waste is under the jurisdiction of the local County Health Department.

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PRETREATMENT

FEDERAL AND STATE PRETREATMENT PROGRAM REQUIREMENTS

Under the terms of the addendum to the "Memorandum of Understanding between Washington Department of Ecology and the United States Environmental Protection Agency, Region 10" (1986), the Department has been delegated authority to administer the Pretreatment Program [i.e. act as the Approval Authority for oversight of delegated Publicly Owned Treatment Works (POTWs)]. Under this delegation of authority, the Department has exercised the option of issuing wastewater discharge permits for significant industrial users discharging to POTWs which have not been delegated authority to issue wastewater discharge permits.

There are a number of functions required by the Pretreatment Program which the Department is delegating to such POTWs because they are in a better position to implement the requirements (e.g. tracking the number and general nature of industrial dischargers to the sewerage system). The requirements for a Pretreatment Program are contained in Title 40, part 403 of the Code of Federal Regulations. Under the requirements of the Pretreatment Program [40 CFR 403.8(f)(1)(iii)], the Department is required to approve, condition, or deny new discharges or a significant increase in the discharge for existing significant industrial users (SIUs) [40 CFR 403.8 (f)(1)(i)].

The Department is responsible for issuing State Waste Discharge Permits to SIUs and other industrial users of the Permittee's sewer system. Industrial dischargers must obtain these permits from the Department prior to the Permittee accepting the discharge [WAC 173-216-110(5)] (Industries discharging wastewater that is similar in character to domestic wastewater are not required to obtain a permit. Such dischargers should contact the Department to determine if a permit is required.). Industrial dischargers need to apply for a State Waste Discharge Permit 60 days prior to commencing discharge. The conditions contained in the permits will include any applicable conditions for categorical discharges, loading limitations included in contracts with the POTW, and other conditions necessary to assure compliance with State water quality standards and biosolids standards.

The Department requires this POTW to fulfill some of the functions required for the Pretreatment Program in the NPDES permit (e.g. tracking the number and general nature of industrial dischargers to the sewage system). The POTW's NPDES permit will require that all SIUs currently discharging to the POTW be identified and notified of the requirement to apply for a wastewater discharge permit from the Department. None of the obligations imposed on the POTW relieve an industrial or commercial discharger of its primary responsibility for obtaining a wastewater discharge permit (if required), including submittal of engineering reports prior to construction or modification of facilities (40 CFR 403.12(j) and WAC 173-216-070 and WAC 173-240-110, et seq.).

WASTEWATER PERMIT REQUIRED

RCW 90.48 and WAC 173-216-040 require SIUs to obtain a permit prior to discharge of industrial waste to the Permittee's sewerage system. This provision prohibits the POTW from accepting industrial wastewater from any such dischargers without authorization from the Department.

REQUIREMENTS FOR ROUTINE IDENTIFICATION AND REPORTING OF INDUSTRIAL USERS

The NPDES permit requires non-delegated POTWs to "take continuous, routine measures to identify all existing, new, and proposed SIUs and potential significant industrial users (PSIUs) discharging to the Permittee's sewerage system." Examples of such routine measures include regular review of business tax licenses for existing businesses and review of water billing records and existing connection authorization records. System maintenance personnel can also be diligent during performance of their jobs in

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identifying and reporting as-yet unidentified industrial dischargers. Local newspapers, telephone directories, and word-of-mouth can also be important sources of information regarding new or existing discharges. The POTW is required to notify an industrial discharger, in writing, of their responsibilities regarding application for a State waste discharge permit and to send a copy of the written notification to the Department. The Department will then take steps to solicit a state waste discharge permit application.

Annual Submittal of List of Industrial Users

This provision requires the POTW to submit annually a list of existing and proposed SIUs and PSIUs. This requirement is intended to update the Department on an annual basis of the status of industrial users in the POTW's service area, without requiring the POTW to go through the process of performing a formal Industrial User Survey. This provision is normally applied to POTWs not serving industrial or commercial users. Although this permit does not require performance of an Industrial User Survey, the Permittee is nevertheless required under the previous section, to take adequate continuous routine measures to identify existing and new industrial discharges.

DUTY TO ENFORCE DISCHARGE PROHIBITIONS

This provision prohibits the POTW from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer. The first portion of the provision prohibits acceptance of pollutants which cause pass-through or interference. The definitions of pass through and interference are in Appendix B of the fact sheet.

The second portion of this provision prohibits the POTW from accepting certain specific types of wastes, namely those which are explosive, flammable, excessively acidic, basic, otherwise corrosive, or obstructive to the system. In addition wastes with excessive BOD, petroleum based oils, or which result in toxic gases are prohibited to be discharged. The regulatory basis for these prohibitions is 40 CFR Part 403, with the exception of the pH provisions which are based on WAC 173-216-060.

The third portion of this provision prohibits certain types of discharges unless the POTW receives prior authorization from the Department. The discharges include cooling water in significant volumes, stormwater and other direct inflow sources, and wastewaters significantly affecting system hydraulic loading, which do not require treatment.

SUPPORT BY THE DEPARTMENT FOR DEVELOPING PARTIAL PRETREATMENT PROGRAM BY POTW

The Department has committed to providing technical and legal assistance to the Permittee in fulfilling these joint obligations, in particular assistance with developing an adequate sewer use ordinance, notification procedures, enforcement guidelines, and developing local limits and inspection procedures.

OUTFALL EVALUATION

Proposed permit condition S.11 requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to determine if sediment is accumulating in the vicinity of the outfall.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department proposes that this permit be issued for five years.

REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.
1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.
1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.
1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.
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2002. City of Kalama, General Sewer/Wastewater Facilities Plan. Consulting Engineers, Seattle, Washington. G&O #01446.

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1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

Laws and Regulations(<http://www.ecy.wa.gov/laws-rules/index.html>)

Permit and Wastewater Related Information
(<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>)

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1994. Permit Writer's Manual. Publication Number 92-109

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1976. Chlorination of Wastewater.

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(E2). (Cited in EPA 1985 op.cit.)

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on January 17, 2004, in the *Longview Daily News* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on May 4, 2004, in the *Longview Daily News* to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Carey Cholski
Water Quality Permit Administrator
Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the 30-day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least 30 days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within 30 days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (360) 407-6554, by going to http://www.ecy.wa.gov/programs/wq/permits/southwest_permits.html, or by writing to the address listed above.

This permit and fact sheet were written by Eric Schlorff.

APPENDIX B--GLOSSARY

Acute Toxicity--The lethal effect of a pollutant on an organism that occurs within a short period of time, usually 48 to 96 hours.

AKART-- An acronym for "all known, available, and reasonable methods of prevention, control, and treatment".

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation --The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

Average Weekly Discharge Limitation -- The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

CBOD₅ – The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celsius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining CBOD₅ is given in 40 CFR Part 136.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a pollutant on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Combined Sewer Overflow (CSO)--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of four discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring --Uninterrupted, unless otherwise noted in the permit.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial User-- A discharger of wastewater to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Infiltration and Inflow (I/I)--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Interference -- A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal and;

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Major Facility--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--A volume that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in State regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

Pass through -- A discharge which exits the POTW into waters of the--State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Potential Significant Industrial User--A potential significant industrial user is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

- a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;
- b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Significant Industrial User (SIU)--

- 1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;
- 2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids are the particulate materials in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

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Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C--TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at <http://www.ecy.wa.gov/programs/wq/wastewater/index.html>

Calculation of pH of a mixture of two flows. Based on the procedure in EPA's DESCON program (EPA, 1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington D.C.)

Based on Lotus File PHMIX2.WK1 Revised 19-Oct-93

INPUT	
1. DILUTION FACTOR AT MIXING ZONE BOUNDARY	79.000
1. UPSTREAM/BACKGROUND CHARACTERISTICS	
Temperature (deg C):	21.23
pH:	7.06
Alkalinity (mg CaCO3/L):	46.00
2. EFFLUENT CHARACTERISTICS	
Temperature (deg C):	22.50
pH:	7.34
Alkalinity (mg CaCO3/L):	35.00
OUTPUT	
1. IONIZATION CONSTANTS	
Upstream/Background pKa:	6.37
Effluent pKa:	6.37
2. IONIZATION FRACTIONS	
Upstream/Background Ionization Fraction:	0.83
Effluent Ionization Fraction:	0.90
3. TOTAL INORGANIC CARBON	
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	55.58

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Effluent Total Inorganic Carbon (mg CaCO₃/L): 38.71

4. CONDITIONS AT MIXING ZONE BOUNDARY

Temperature (deg C): 21.25

Alkalinity (mg CaCO₃/L): 45.86

Total Inorganic Carbon (mg CaCO₃/L): 55.37

pKa: 6.37

pH at Mixing Zone Boundary: 7.06

Dissolved oxygen concentration following initial dilution.

References: EPA/600/6-85/002b and EPA/430/9-82-011

Based on Lotus File IDOD2.WK1 Revised 19-Oct-93

INPUT

1. Dilution Factor at Mixing Zone Boundary: 79

2. Ambient Dissolved Oxygen Concentration (mg/L): 8.9

3. Effluent Dissolved Oxygen Concentration (mg/L): 2

4. Effluent Immediate Dissolved Oxygen Demand (mg/L): 0

OUTPUT

Dissolved Oxygen at Mixing Zone Boundary (mg/L): 8.81

Freshwater un-ionized ammonia criteria based on EPA Gold Book
(EPA 440/5-86-001) as revised by Heber and Ballentine (1992).

Based on Lotus File NH3FRES2.WK1 Revised 12-Dec-94

INPUT

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1. Temperature (deg C; 0<T<30):	21.2
2. pH (6.5<pH<9.0):	8.00
3. Total Ammonia (ug N/L):	18.9
4. Acute TCAP (Salmonids present- 20; absent- 25):	20
5. Chronic TCAP (Salmonids present- 15; absent- 20):	15

OUTPUT

1. Intermediate Calculations:	
Acute FT:	1.0000
Chronic FT:	1.4125
FPH:	1.0010
RATIO:	13.5000
pKa:	9.3621
Fraction Of Total Ammonia Present As Un-ionized:	4.1636%
2. Sample Un-ionized Ammonia Concentration (ug/L as NH3-N):	0.8
3. Un-ionized Ammonia Criteria:	
Acute (1-hour) Un-ionized Ammonia Criterion (ug/L as NH3-N):	213.5
Chronic (4-day) Un-ionized Ammonia Criterion (ug/L as NH3-N):	34.5
4. Total Ammonia Criteria:	
Acute Total Ammonia Criterion (ug/L as NH3-N):	5,128
Chronic Total Ammonia Criterion (ug/L as NH3-N):	827

Requirement for Permit Limits
Determination of Reasonable Potential to Violate Standards at
the Edge of the Mixing Zone.
Based on EPA/505/2-90-001

INPUT			
Parameter	Ammonia	Copper	Lead
Confidence Level and Probability Basis:	0.95	0.95	0.95

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Coefficient of Variation for the Effluent Concentration (CV) (0.6 or a calculated CV if there are more than 10 data points):	0.60	0.60	0.60
Number of Effluent Samples or Data Points (ND):	2.00	7.00	1.00
Highest Effluent Concentration or Value (HV):	13000.00	57.00	0.80
Dilution Factors (1/{Effluent Volume Fraction}) or plumes model			
Acute Receiving Water Dilution Factor:	23.00	23.00	23.00
Chronic Receiving Water Dilution Factor:	79.00	79.00	79.00
Water Quality Standards (Concentration)			
Acute (one-hour) Criteria:	5128.00	8.65	29.30
Chronic (n-day) Criteria:	827.00	6.14	1.14
Upstream Receiving Water Concentration:			
Upstream Concentration for Chronic Condition (7Q10): 90th%-tile	18.90		
MECB: 1-9 data points, highest value; >10 calculate 90th %-tile		2.80	0.38

OUTPUT

Percentile Represented by the Highest Concentration in Data Set ($p_n = (1 - \text{confidence level})^{1/ND}$)	0.22	0.65	0.05
Normal Distribution Value for 95th Percentile	1.64	1.64	1.64
Normal Distribution Value for 22th Percentile	-0.76	0.39	-1.64
$\sigma^2 = \ln(CV^2 + 1)$	0.31	0.31	0.31
$C95 = \exp(1.645\sigma - 0.5\sigma^2)$	2.13	2.13	2.13
$C22 = \exp(-0.76\sigma - 0.5\sigma^2)$	0.56	1.06	0.34
Reasonable Potential Multiplier = $C95/C22$	3.79	2.01	6.20
	49328.8		
Maximum Expected Concentration of Pollutant in Effluent (MEC):	9	114.29	4.96
Acute - Concentration of Pollutant at the Edge of the Mixing Zone (CP):	2144.73	4.97	0.22
Chronic - Concentration of Pollutant at the Edge of the Mixing Zone (CP):	643.08	4.21	0.44
Acute - Concentration of Pollutant at the Edge of the Mixing Zone (CP) with .95 trans fact.:	22.84	22.84	22.84
Chronic - Concentration of Pollutant at the Edge of the Mixing Zone (CP) with .95 trans fact.:	22.84	22.84	22.84
Reasonable Potential to Violate Acute Criteria at the Edge of the	NO	NO	NO

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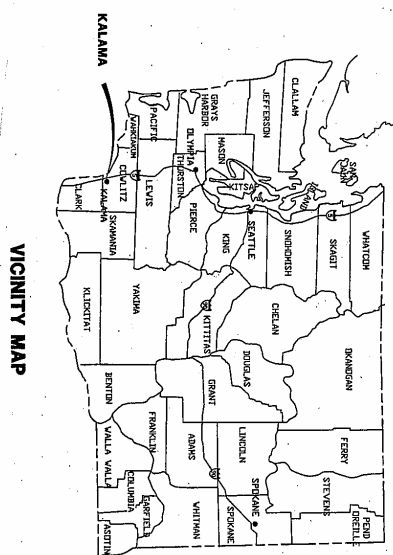
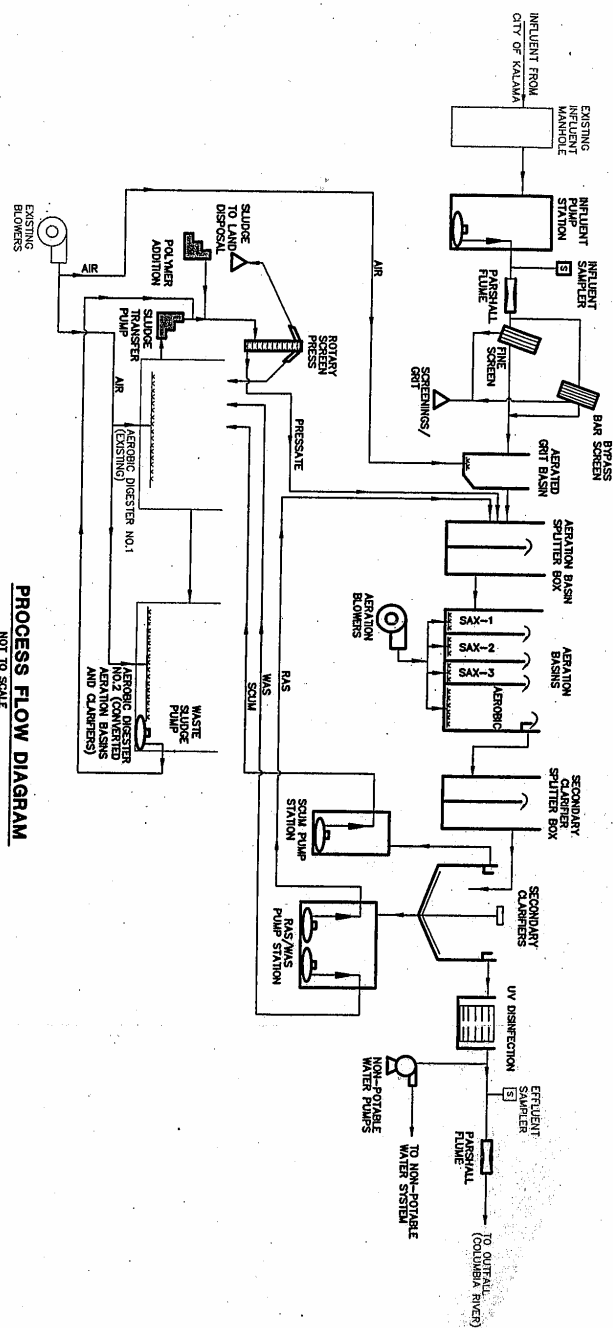
Mixing Zone (RP):

Resonable Potential to Violate Chronic Criteria at the Edge of the
Mixing Zone (RP):

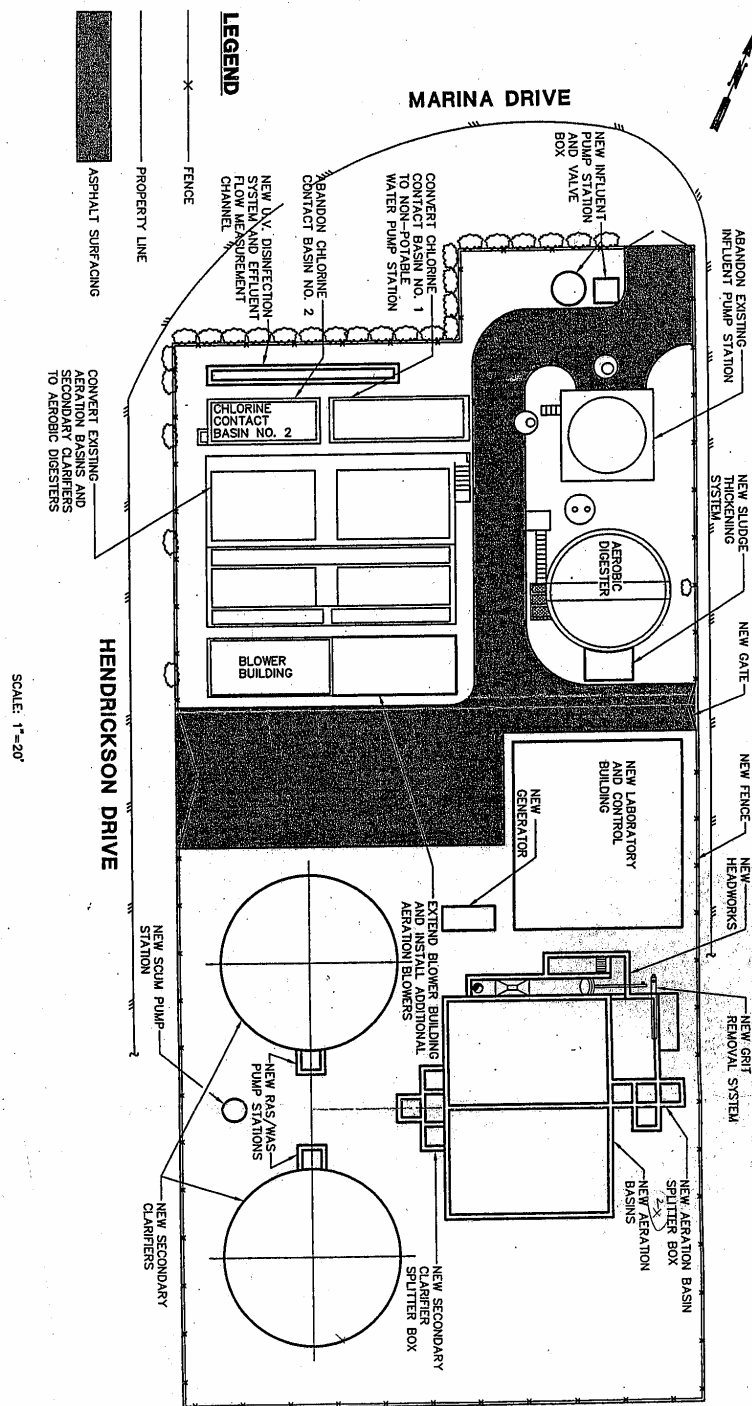
NO

NO

NO



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CITY OF KALAMA



**DECLARATION OF CONSTRUCTION OF WATER POLLUTION CONTROL
FACILITIES - MUNICIPAL**

Instructions:

- A. Upon completion, and prior to the use of any project or portions thereof, a professional engineer shall complete and sign this form, declaring that the project was constructed in accordance with the provisions of the construction quality assurance plan and with the plans and specifications and major change orders approved by the Department of Ecology.
- B. If a project is being completed in phased construction, a map shall be attached showing that portion of the project to which the declaration applies. A declaration of construction must be submitted for each phase of a project as it is completed. Additional declaration forms are available upon request from the Department of Ecology offices listed below.

NAME AND BRIEF DESCRIPTION OF PROJECT:

.....
.....
.....
.....

NAME OF OWNER..... DOE PROJECT NO...
ADDRESS DATE PROJECT OR
..... PHASE COMPLETED...
CITY ... STATE ZIP .

DOE PLAN AND
SPECIFICATION
APPROVAL DATE

I hereby declare that I am the project engineer of the above identified project and that said project was reviewed and observed by me or my authorized agent in accordance with the provisions of the construction quality assurance plan. I further declare that said project was, to the best of my knowledge and information, constructed and completed in accordance with the plans and specification and major change orders approved by the Department of Ecology and as shown on the owner's "as-built" plans.

DATE _____
Signature or Professional Engineer

SEAL OF REGISTERED
WASHINGTON STATE
ENGINEER

Please return completed form to the Department of Ecology office checked below.

☒ Southwest Regional Office
Department of Ecology
P.O. Box 47775
Olympia, WA 98504-7775

☐ Central Regional Office
Department of Ecology
15 W. Yakima Ave., Suite 200
Yakima, WA 98902-3401

☐ NW Regional Office
Department of Ecology
3190 160th Ave., S.E.
Bellevue, WA 98008-5452

☐ Eastern Regional Office
Department of Ecology
N. 4601 Monroe St., Suite 202
Spokane, WA 99205-1295

APPENDIX D--RESPONSE TO COMMENTS

The following comment was received by the City of Kalama:

Comment:

Please accept this letter as a formal request to eliminate the proposed NPDES permit requirement for the city of Kalama to perform temperature monitoring in the Columbia River. The proposed requirement appears to be a means for the DOE to receive free temperature data on the Columbia River at the expense of our citizens. The permit information we received from you states our effluent temperature is well below levels of concern.

Our citizens have incurred \$7 million in debt to keep the Columbia River clean. We do not need to incur further debt for driving piling or buying a boat for temperature monitoring. We believe this requirement is unwarranted based on the fact that EPA does not require the more stringent standard.

Response:

Although we have not placed limits in the permit at this time, there is still concern that temperature may be a problem and limited in the future. The ambient temperature in the Columbia was 21.23°C which is well above the criterion of 20.0°C. However, the ambient temperature is based on data gathered at some distance from the Kalama outfall. It is therefore important for the Permittee to clarify if a temperature problem exists in the ambient environment. The Permittee's effluent temperature also appeared high at 22.5°C. The temperature monitoring will remain a requirement of the permit. A data logging temperature thermistor mounted to a piling or float may be used to minimize staff time gathering data.